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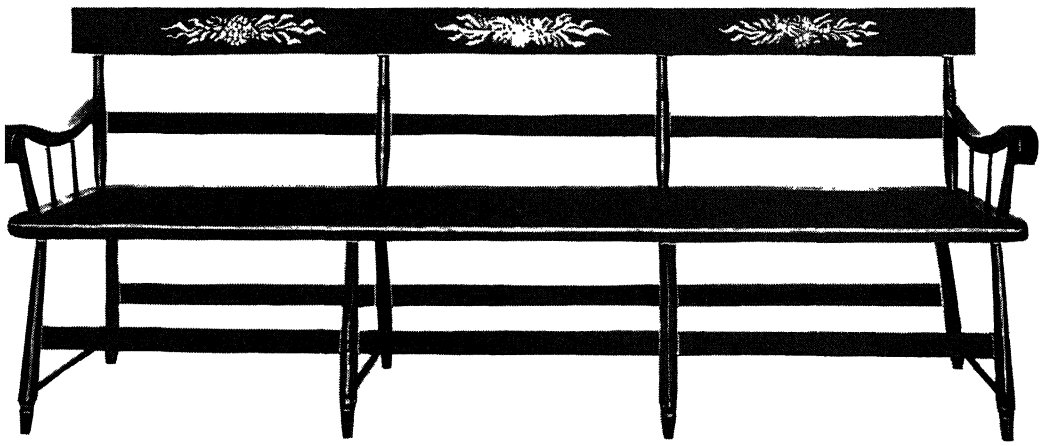
Refinishing Furniture at Home



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Foreword

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PIECES OF FINE FURNITURE formerly in poor condition, have been refinished and restored for use in Ohio homes; some of these pieces are modern and others old. Chairs, chests, tables, and other furniture made by early Ohio craftsmen or by other early American cabinet makers, today are in good repair, and are highly prized by their owners; other pieces of similar value are ignored and stored in remote spaces in homes because spots, stains, or other defects mar the furniture's beauty or usefulness.

Each year, many Ohio families refinish pieces of furniture in their homes. Great pleasure awaits the worker who enjoys beautiful furniture when he removes a thick, old finish from a piece, revealing the beauty of the color and grain of the wood, and when he visualizes the type of finish which will enhance the wood's natural beauty. Through refinishing furniture, a family may develop a clearer knowledge of how to care for the various finishes of the pieces of furniture in the home. Amateurs may become skilled craftsmen as they observe and study cabinet woods and their finishes, and have experiences in working with them.

Although refinishing is not difficult, it requires patience, time, energy, and some expenditure of money to accomplish the best results. Before starting to refinish, each worker must determine whether or not the piece of furniture is worth the time and energy necessary for repairing it. It is well to remember that a piece of furniture is valuable in the home only when it is well designed, well constructed, and serves some worthy purpose. Such a piece may be either old or new. It is unwise for individuals who have little energy or time or who are unwilling to persevere with the processes of refinishing to attempt it; they may wish to have their furniture refinished by a professional refinisher.

A professional refinisher with adequate skill and equipment to refinish furniture satisfactorily is available in many communities. On the other hand, the cost of refinishing materials is small; the total expenditure of money for materials to refinish a piece of furniture varies with its size and the type of finish used. A family or an individual may experience great satisfaction from refinishing a piece of furniture well.

We hope that the information in this bulletin may enrich the experiences of individuals who refer to this publication for guidance, as they refinish their furniture.

Anne Biebricher

Professor Clarence C. Ross, of the College of Education, the Ohio State University, was co-author of the first edition of this bulletin issued in 1939. The bulletin was revised in 1940. This is the third edition, June, 1943.

Refinishing Furniture at Home

WHAT FURNITURE is worth refinishing? To be worth the effort and expense of refinishing, a piece of furniture should possess the qualities of utility and beauty. All furniture should serve some purpose, and must be sturdy enough to serve that purpose.

If furniture is poorly constructed or poorly designed, its usefulness will be impaired. The fact that much old furniture has survived the wear of many years without being broken or destroyed proves that it had this desirable quality of strength. The principal cause of breakage of furniture is faulty design. Another cause of breakage is loosening of the joints, or of the veneering due to loss of strength of the glue.

Beauty in furniture consists of a number of elements. One of the most important of these is that of *proportion*. To be well proportioned, the outside dimensions of length, depth, and height must have a pleasing relationship. Another constituent of beauty is that of *shape or contour*. The straight lines and curves of the piece of furniture should be pleasing. A third factor that makes for beauty in furniture is *color*. The color and finish of a piece of furniture should harmonize with the other pieces in the immediate vicinity. Large pieces of furniture should usually be less colorful than small ones. Ornamentation, if present, should be considered in relation to beauty. Some of the finest furniture possesses little ornamentation.

Carving, mouldings, fancy veneers, wood turnings, and metal furniture mounts, such as drawer pulls, all play a part in ornamentation. No ornament should appear to be of greater importance than the furniture itself, nor should an ornament encroach on the strength or utility of the furniture. For example, carving of the legs of a chair may take from its strength, and carving of the back may make a chair very uncomfortable.

An appreciation of good furniture may be acquired through reading good books on furniture, and by studying pictures and examples of good furniture.

The finishes and finishing methods described in this bulletin are simple and practical, and are used by many professional finishers doing fine work. The materials required are few and can be procured at most hardware or paint stores. Beautiful finishes can be obtained by the amateur who has the time and energy, and will follow instructions carefully.

Refinishing Materials in War Time

A number of materials commonly used in refinishing processes before the war are needed for making supplies for war, and therefore are available for civilian use either in limited amounts or not at all. The supply of some materials may vary in markets. Although some materials cannot now be used, others are available to take care of refinishing needs.

Care needs to be taken not to waste valuable materials at this time. Shellac, alcohol, steel wool, ammonia, and some of the basic materials formerly used in lacquers are today serving a vital part in the war effort. Varnishes and paints may be of the slower drying type.

Processes Preceding the Removal of the Finish

It is best before starting upon the refinishing process to do all regluing and make all other repairs necessary.

Warped Furniture Surfaces.—If a table leaf is warped, the best method of straightening it is to saw it lengthwise into several pieces and then reglue the pieces. This process calls for the skill of a woodworker and had best not be attempted by the beginning wood finisher.

Warped table tops that are fastened to the table by means of screws or top clips usually can be straightened by a process known as "saw kerfing." This consists of sawing a series of slots or kerfs parallel with the grain on the under side of the table top by means of a circular saw. Usually the kerfs are sawed to within about ¼ inch of the top surface, and do not extend through the ends of the top (see Fig. 1). Any woodworking shop or lumber yard that possesses a circular saw can quickly saw kerf a table top. This allows the top to straighten out flat when screws are inserted, and thus removes the warp.

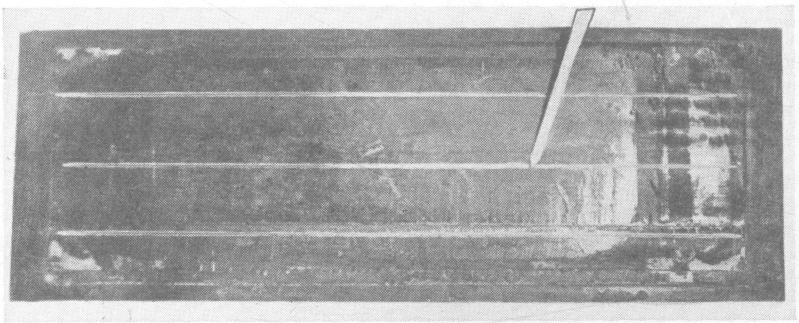

Fig. 1.—The pointer indicates the center one of three kerfs in the under side of a table top.

Much warping in old furniture is due to the fact that the under surfaces were left unfinished. This permits atmospheric moisture to penetrate the unfinished side and causes swelling which may result in warping. For this reason, the unexposed surfaces of furniture should be given one coat of finish.

Testing Joints.—First test the piece for tightness of joints. Gently yet firmly, move the different parts of the piece back and forth and notice whether or not any joints are loose.

Numbering of Furniture Parts.—If the furniture is found to have loose joints, it should be taken apart preparatory to regluing. Before doing this, mark all adjoining parts with corresponding numbers, placing the numbers inside of the joint, where they will not show. Such identifying marks are helpful in reassembling the parts correctly.

Taking Furniture Apart.—In taking any furniture apart, endeavor to remember exactly how each member fits its neighbor. Use care to avoid cracking or damaging the joints. Many loose joints can be pulled apart with the hands. If this cannot be done easily, the joints can be separated by striking one

of the members. To prevent marring, hold a piece of soft wood against it and strike sharply with a hammer.

In the case of a table, it is usually best to remove the table top, even if the table does not require regluing. Table tops usually are held by screws to the frame. Before removing a table top it is best to mark its position in reference to the table legs.

Cleaning Glue Joints. — After taking the furniture apart, the next step is to prepare all loose joints for regluing. This is done by removing all old glue. New glue will not hold over old glue. For this operation use a knife or chisel. Old glue is usually brittle and can be removed by inserting the edge of the tool between the wood and the glue, thus chipping it off. Glue can also be removed by scraping with the edge of a knife or chisel. In removing old glue, care should be taken that no wood is chipped or scraped from the joint.

Types of Furniture Glues. — The two types of furniture glue generally used are animal glue and casein glue. The best animal glue is made from the hides of slaughtered animals. Animal glue is sometimes called hot glue. It comes in various forms, as ground glue, sheet glue, and stick glue. A good grade of sheet or stick glue is recommended.

In preparing to use animal glue, first break the sheets or sticks into pieces and place them in a container. Cover with *cold water.* Animal glue should never be dissolved in hot water, as this causes loss of strength. After about twelve hours the glue will have soaked up the water and the flakes or sticks become a jelly-like mass. The glue is ready for heating when all parts of it can be pinched apart with the thumb and forefinger.

To heat animal glue, place the glue pot in a can of water and allow the water in the outer boiler to simmer gently. Do not allow the water in the outer container to boil. Glue heated to the boiling point will lose much of its strength in a very short time. Never heat the glue pot directly over a flame.

It is not advisable to prepare more glue than will be needed to complete the work at hand. Bacteria from the air cause animal glue to spoil quickly after the glue has been prepared for use. The strength of animal glue diminishes with each reheating.

Animal glue is used by most furniture factories and cabinet makers. It flows and works easily, and does not stain the wood. Animal glue has one serious disadvantage for the beginner — it sets or hardens quickly. Only about a minute is required for hot glue to set. The time for setting may be lengthened to several minutes by first warming the wood to a temperature that feels hot when touched to the cheek.

Casein glue requires about ten to fifteen minutes to set. For this reason it may sometimes be used to advantage, but it has the disadvantage of staining wood with which it comes in contact. Casein glue is a product of skimmed milk, and can be purchased in most hardware stores under various trade names. It comes in powdered form, and is prepared by mixing with an equal amount of *cold* water. Complete directions for mixing are found in the containers. Precautions to be taken to avoid staining by casein glue will be described later. The use of fish glue is not recommended in furniture work.

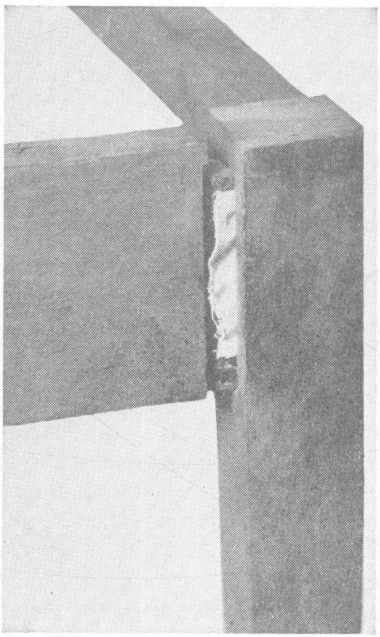

Fig. 2.—Mortise and tenon joint to be tightened by placing a piece of cloth over the tenon.

Fig. 3.— A dowel joint to be tightened by placing two crossed strips of cloth upon the dowel.

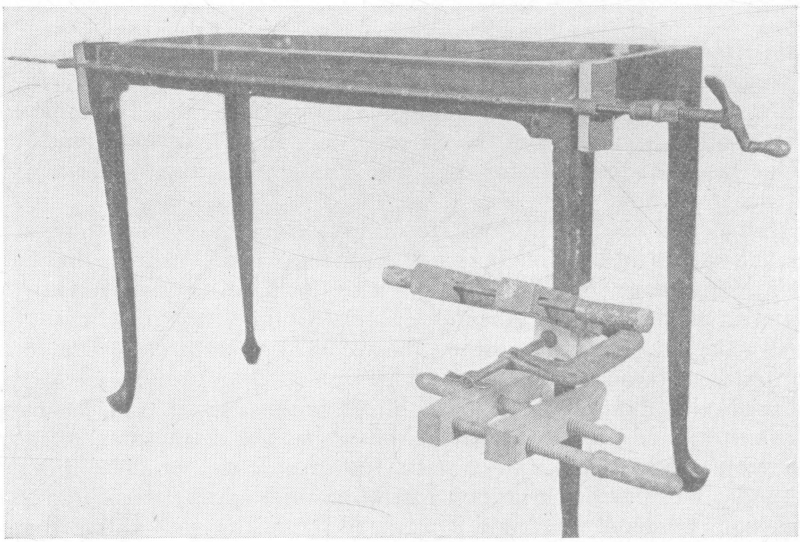

Fig. 4.—Two front legs clamped together by a steel bar clamp. The cracked right front leg which has been glued, is clamped with two screws and an iron C-clamp. Note use of soft pine blocks between all clamp jaws and furniture to prevent marring the latter.

Synthetic resin glue is a comparatively new type of adhesive which is used in wood working. Such glues usually require the application of heat, and set quickly. They have good dry strength and are high in water resistance. These glues are durable under damp conditions. They stain the wood very slightly, if at all. For mixing, follow the directions on the container.

Gluing. — Having removed the old glue from the joints and prepared the glue, the piece is now ready for regluing. To prevent glue from adhering to an old finish, the outside surface of the furniture may be rubbed with soap, or coated with vaseline or linseed oil. However, in gluing unfinished wood, never allow grease to come in contact with any surface, regardless of whether glued or otherwise. Some stains will not color grease spots, and many finishes will not dry over a greasy surface.

Strength in a glue joint requires that all surfaces fit closely; glue has little strength in itself. A mortise and tenon joint that is loose may be made tight by placing a piece of stout muslin or other cloth over the end of the tenon as in Fig. 2. Usually one thickness of the cloth will insure a tight fit. In the case of a dowel joint, as shown in Fig. 3, two small crossed strips of cloth will be sufficient to make a tight joint. Both parts of the joint and the muslin should be well covered with glue.

Before starting to reglue the furniture, it should first be reassembled and clamped without glue. This is known as "dry gluing," and enables the finisher to know rather accurately how the piece goes together.

Clamping. — Assemble clamps with which the piece of furniture will be held together during the time the glue is hardening. Bar clamps or cabinet clamps may be used (see Fig. 4). When these are not available, twisted rope or wire as shown in Fig. 5 may be used. Clamps such as are used on the frames of curtain stretchers are useful in many gluing operations.

Fig. 5.—Joined members drawn to the desired position by the use of a twisted rope or wire.

Another method of clamping is by the use of a wooden bar and wedges which force the joint into position and hold it until dry. This wooden bar or stick has two blocks nailed or clamped upon it. The wedges shown in the illustration hold the joints

tightly in place between these blocks (see Fig. 6). All parts of a joint must fit tightly.

In all clamping, blocks of soft wood should be placed between the jaws of the clamps and the surface of the wood to prevent marring.

After it is known that the pieces will fit together properly it should be taken apart and the glue put on each part of the joints, then the whole rapidly put together and held tightly in place with clamps. About twelve hours are required for the glue to harden; at the end of this period the clamps may be removed.

Removal of Excess Glue. — Immediately after the furniture has been glued and clamped, all excess glue should be removed while it is soft. It is a lengthy process to remove excess glue if it is permitted to harden, and it is difficult to do so without marring the wood. Removal of excess glue is especially important if a piece of furniture is to be given a transparent finish. Animal glue while still soft may be removed by peeling it off with a stick sharpened like a chisel, and then thoroughly wiping the surface from which the glue was removed with a wet cloth. Casein glue can be removed with a sharpened stick, followed by the use of application of a concentrated solution of oxalic acid. Oxalic acid prevents the casein glue from permanently staining the wood. Oxalic acid in crystalline form can be purchased in drug stores.

Method of Preparing a Concentrated Solution of Oxalic Acid:

$\frac{1}{2}$ pint of water
6 heaping teaspoons of oxalic acid crystals

Stir the mixture. *Note:* Do not expect that all the crystals will dissolve in the water.

Oxalic acid is a poison and should be so labeled.

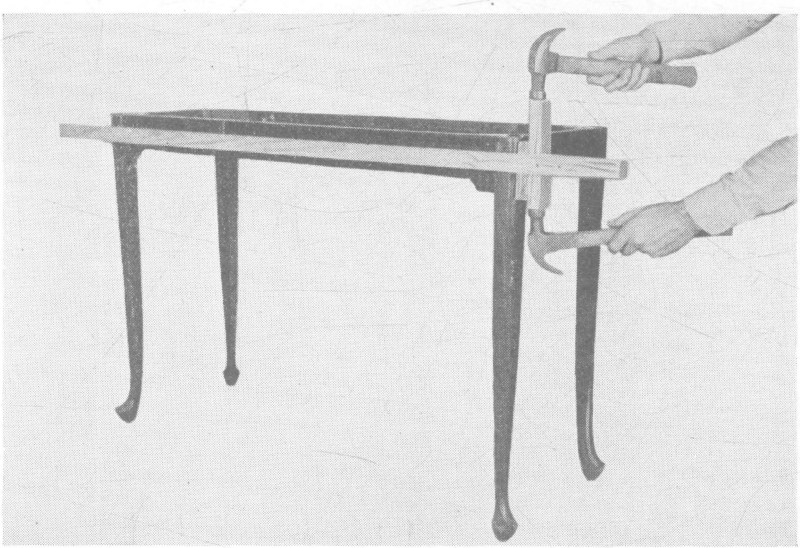

Fig. 6.—An efficient clamp may be constructed by using a wooden bar and two wedges.

Removing Old Finishes

When the furniture is in sturdy condition the next step is to remove the old finish. If the piece has the usual varnish or shellac finish, this is best removed by means of a varnish remover. Most varnish removers consist of benzol and other chemicals to which paraffin has been added. The paraffin forms a film on top of the remover after being applied to the furniture and retards evaporation, thus giving it opportunity to soften the varnish or paint.

Caution: Most of the liquids used in furniture refinishing are either highly inflammable or explosive. Finishing should not be done around open fires, or in rooms that are not well ventilated. Observe great care in making or using varnish remover around stoves or furnaces.

If only a small amount of varnish remover is required it will probably be best to buy a commercial product, because commercial removers are efficient and the difference in cost is not great. Such materials as benzol, alcohol, or ammonia are used to meet war needs, and may not be available except for civilian necessities during war time. However, for those interested in making their own varnish remover, when and where materials are available, the following formulas are given.

Formula No. 1:

10 parts benzol
10 parts denatured alcohol
1 part paraffin

To avoid danger of fire the paraffin may be grated or shaved with a knife and added to the solution. Although all the paraffin may not dissolve, this method of adding paraffin is safe. Shake the varnish remover before applying.

Formula No. 2:

1 part turpentine
2 parts ammonia

Shake in a bottle until the mixture appears milky. Formula No. 2 tends to bleach the wood.

Wood can be burned and discolored with lye; therefore it is unwise to use lye as a paint or varnish remover unless it is skillfully handled. Glued joints and surfaces may be loosened by water standing on the surface of the furniture.

Removing Transparent Finishes.—Removing varnish is not a difficult process, except that patience is required. Varnish remover is best applied with a stiff bristle brush. Flow the remover over the finish. It will be observed within a few minutes that the old finish has become soft and somewhat mushy. In this condition it can be wiped off with old rags. The wiping should be done with the grain of the wood wherever possible. Some refinishers brush the softened surface with a soft wire brush before removing the varnish. To prevent scratching, the surface is brushed only with the grain.

To scrape old finish from a large flat surface, use an instrument similar to that used for cleaning windows. Such a tool can be purchased, or it can be made by tacking a straight piece of heavy leather, about 4 inches long, to the edge of a block (see Fig. 7). To remove varnish from carved ornaments and

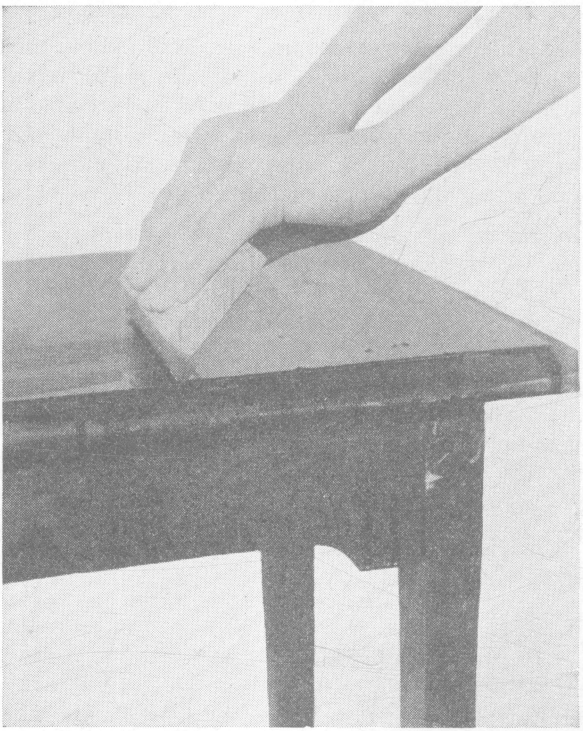

Fig. 7.—A piece of leather tacked upon a block makes a convenient and effective tool for removing varnish from flat surfaces.

crevices, apply remover as usual then brush with a stiff bristle brush. A small stick sharpened like a chisel is useful in cleaning cracks. Many parts of the furniture will require more than one application of remover.

After each coat of remover has been applied and removed, the remaining spots of the old finish can be recognized by their brightness. All surfaces from which the varnish has been removed will be dull in appearance. Apply additional remover to all bright spots. Then remove in the manner described.

Take care when removing the old finish from the edges of veneered surfaces or from such trimmings as moldings or carvings, so as not to break or loosen them. Avoid harsh scraping or cross-grain sanding.

Removing Paint and Enamel. — Removing paint or enamel from furniture is much harder than removing varnish, although the process is the same. The coloring matter of old paint or enamel which has penetrated the pores of the wood is difficult to remove. A dull knife may aid in scraping off the paint that has been softened by the varnish remover.

Removing the Varnish Remover. — After all the varnish or paint has been removed, the next step is to remove all traces of the varnish remover, because the paraffin it contains will interfere with the successful application of the finishing coats that are to follow. This is done by thoroughly wiping the surface of the furniture with a clean cloth soaked in turpentine or in naphtha, high test gasoline (do not use ethyl), or alcohol.

Caution: The last three liquids are highly inflammable. Do not use around fire.

Old finish which collects on the hands is difficult to remove. Protecting the hands with gloves is advised when working with varnish remover.

Smoothing the Surface. — After all surfaces have been freed of the old finish, they should be examined to see if they are smooth. Rough surfaces should be sanded very lightly with fine sandpaper or garnet paper. For this purpose use 1/0 flint paper, or 2/0 garnet paper. Sandpapering is done either by holding the paper in the palm of the hand or by the use of a sandpaper block. To make a sandpaper block take a flat piece of wood about 2 inches wide and 3½ inches long. Wrap the sandpaper around this block. A pad formed of three or four thicknesses of cloth should be placed between the block and the sandpaper. This enables the sandpaper to reach slight irregularities that are present in most surfaces. The pad also prevents the edges and corners of the block from scratching the surface of the furniture (see Fig. 8).

In sandpapering, move the sandpaper back and forth in a direction parallel to the grain of the wood. *Never sand with a circular motion, and never sand across the grain of the surface.* Cross-grain sanding scratches the wood, and the scratches will show clearly after furniture is refinished. The finer the finish, the more noticeable scratches become.

If the old finish has been carefully removed there will usually be little need for sandpapering. Great care should be taken to prevent sanding deeply enough to remove the antique appearance of the surface. Most cabinet woods become more beautiful as sunlight and time act upon them. This color should not be destroyed by sandpapering.

Treatment of Spots. — Dark spots and stains may be removed by carefully sanding them until the color of the wood approaches that of the surrounding area. Dark spots and stains may be bleached by applying a concentrated solution of oxalic acid and allowing it to dry. (See page 8 for making an oxalic acid solution.) Several applications of oxalic acid may be necessary to remove the blemishes. Allow each coat to dry before applying another coat. After the

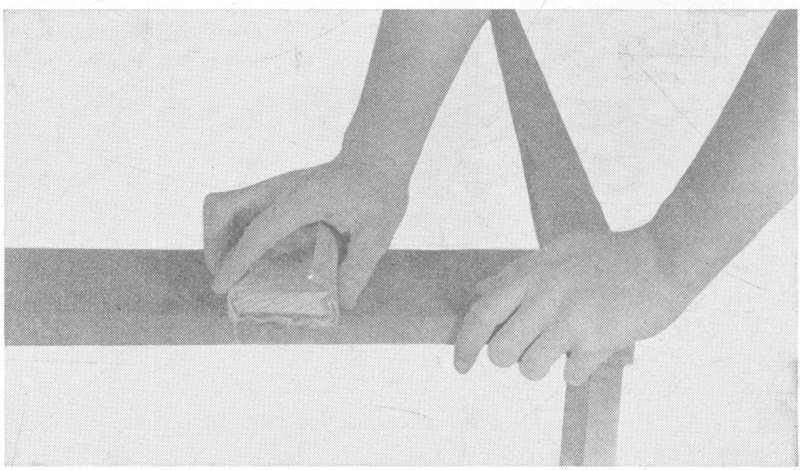

Fig. 8.—A wooden block padded with cloth forms a flexible surface which permits the sandpaper to adjust to surface irregularities.

spot is removed wash the surface with weak soda or ammonia solution, then with clear water, as any remaining oxalic acid will interfere with the finishing processes. If the spots are rough after drying, sand lightly with fine sandpaper.

Bleaching. — Many pieces of modern furniture have been bleached and finished with a blond finish during recent years. The wood, for such a finish, may be bleached lighter than the color of naturally light woods. A strong bleach is necessary to change the color of the wood so thoroughly, and is safer to be handled by the professional. Effective bleaches have been developed for this purpose. Oxalic acid may be used to lighten the color of wood.

Treatment of Surface Scars. — Old furniture usually has many depressions and scars resulting from years of use or abuse. The finisher should decide whether these marks of time should be concealed or whether they should remain. For example, if a chest of drawers is known to be 100 years old, there is usually no reason for attempting to make it look like new by hiding the mars that are an outgrowth of time and use. Many people prefer to leave these evidences of age, unless they are too conspicuous or unattractive.

The smaller scars of use and age usually neither detract from the appearance nor value of old furniture. Some of the finest modern furniture is deliberately scarred and then finished in such manner as to achieve the appearance of age and use. If the furniture is relatively new, it may be most attractive if reconditioned so that it has the appearance of new furniture, in so far as possible.

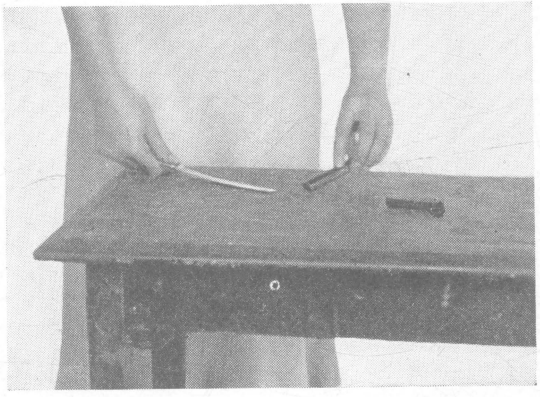

Fig. 9.—Filling a depression with melted stick shellac.

Many small dents and depressions can be raised to the surface by placing several thicknesses of a wet cloth over the scar, then holding a hot iron to the cloth until steam is generated. Frequently this will cause the depression to rise. It may be necessary to repeat this process several times.

Filling Small Holes and Cracks. — For deep dents, scars, or cracks the best filler is stick shellac. Shellac sticks may be purchased in a wide variety of colors at some hardware or paint stores. Select shellac sticks that match the color of the desired finish. Stick shellac is applied to the depression in much the same way that a tinner uses his soldering iron. Heat the blade of an old table knife or a slender kitchen spatula over a flame. Rub the heated blade upon a cloth to remove any soot. Now touch the heated blade to the stick shellac and melt sufficient shellac to fill the depression (see Fig. 9).

Caution: Never heat stick shellac directly in a flame and allow it to drop into the depression, as this causes the shellac to become gummy.

Remove surplus shellac with a sharp chisel or knife until level with the surrounding surface, then sandpaper with fine sandpaper, *taking care not to sand through the surrounding color or stain of the wood.* If desired, scratches imitating the grain of the wood can be made in the smooth surface of the shellac with a sharp razor blade or the point of a needle; this will make the defect difficult if not impossible to detect when the piece is finished.

A mixture of fine wood dust and animal glue may be used as a crack filler. However, this is not recommended, as it is difficult to produce a uniform color.

Remove all glue from the wood surface surrounding the crack, before the glue is dry.

Plastic wood, while not often used by professional finishers, can be obtained in various colors and will be found quite satisfactory for large holes or cracks. Apply according to directions on the container.

Make a final examination to see that all surplus glue has been removed and that all objectionable dents and stains have been treated. With the old finish removed and the wood in good condition, the piece is ready for refinishing. A number of different finishing methods are described in the following paragraphs.

Methods of Refinishing

The principal purpose of finishing wood is to enhance or bring out its natural beauty. A good finish is *usually thin,* and thus does not give the wood the appearance of being enclosed in glass. Exceptions to the rule are the finishes placed upon pianos and violins.

A finish generally should not be so bright that upon entering a room the eye is attracted by the glitter of the finished surfaces. The following methods of staining and then coating with shellac, varnish, and clear brushing lacquer are mostly used for refinishing (see page 3, "Refinishing Materials in War Time").

Wood Staining

Most furniture is refinished by staining the wood and then applying a suitable transparent finish over the stain. Many fine woods such as mahogany, walnut, cherry, and maple over a period of years will naturally acquire a beautiful color, due to the effect of time upon the wood. A stain should enhance the beauty of the natural color of fine wood or enrich a less beautiful wood through the addition of color. Mahogany and cherry, which are naturally of a reddish tone should, therefore, not be stained brown like walnut, neither should walnut be stained the reddish brown of mahogany. Old maple, if stained at all, should be stained a very light honey brown.

The grain of each wood differs, and stain cannot alter the appearance of the grain. Oak is a coarse open grained wood, while mahogany and walnut are of finer grain. Woods such as cherry and plain maple are so closely grained that the grain becomes practically invisible.

Many people in refinishing old furniture make the mistake of staining the piece too dark. It should be remembered that old furniture has already been

stained and little or no stain is required. A weak or dilute stain that will even the inequalities in color of the old piece is all that is required in most cases.

The four principal classes of stains are water stains, spirit stains, acid stains, and oil stains. The first three types of stains are unsuitable for the amateur refinisher. Water stains are made by dissolving dye colors in water. They are the most beautiful of all stains, but unfortunately can only be used upon clean unfinished wood. Spirit stains are made by dissolving colors in alcohol. Spirit stains are seldom used, because they dry with a hard metallic sheen. Occasionally spirit stains are used for staining drawer interiors. Acid stains are rarely used in refinishing, since more satisfactory results can be obtained with oil stains. The refinisher will find that the oil stains generally are most satisfactory for restaining old furniture.

Commercial oil stains may be purchased in many colors. The amateur can easily make oil stains by using the following formula, which will make approximately 1 pint of stain.

Foundation Formula for Oil Stain:

½ pint of linseed oil
½ pint of turpentine
1 tablespoon of Japan drier

Add enough oil color to obtain the color desired. To this mixture of oil, turpentine, and Japan drier any desired color may be added, provided the color can be ground in oil. For a medium brown walnut or oak, add burnt umber; if a dark red for mahogany or cherry is desired, use burnt sienna; and for lighter reds use any of the iron oxides, as Indian red, light red, or Venetian red. These colors can be purchased either in powdered form or ground in linseed oil.

Add the color to the liquid mixture, stirring well, then try the stain upon a sample piece of wood. Continue until the desired color is obtained. The reds may be mixed with the browns. Lamp black may be added to darken a mixture. Stir the stain occasionally to prevent the color from settling to the bottom of the container.

Burnt umber is a rich warm brown that is suitable for staining most old or antique furniture. It can be used upon walnut, cherry, and mahogany. Oak usually requires a dark brown such as Van Dyke brown. Oak is exceptionally well adapted for the use of oil stains. A soft porous wood such as old pine requires a very dilute or weak stain of burnt umber. The same is true for old maple. Old woods such as walnut, cherry, or mahogany usually require little staining; however, if a darker shade is required than can be obtained with the above oil stains, a penetrating stain can be made by using the following formula:

Formula for Penetrating Stain:

1 part benzol
1 part of naphtha or high test gasoline (no ethyl)

Add sufficient oil color to the above mixture.

Caution: Dispose of all pieces of oily cloth because they are highly inflammable, due to the linseed oil in them. Burn all oily cloths, or place them in an air-tight container. Oily rags left in a pile may catch on fire due to spontaneous combustion.

After the oil stain has been applied, the furniture surface should be wiped with a clean cloth and allowed at least twenty-four hours to dry. If after drying it is found that some surplus stain remains, it can be removed by rubbing the area with a cloth moistened in turpentine, naphtha, or gasoline. Then touch up this spot with the stain, and again wipe.

Varnish stain is varnish to which coloring matter has been added. Although a piece of furniture may be stained and varnished in one operation by using varnish stain, this material conceals the grain of the wood. This method usually results in inferior and disappointing work.

Finishing with Shellac

Shellac is used as a finish on many pieces of fine furniture. Shellac does not crack with age, and is hard to mar or scratch as compared with varnish. However, shellac has the disadvantage of not being waterproof, and should not be used upon furniture that may come in contact with water. A shellac surface may be partially waterproofed by a coat of furniture wax.

After staining the piece, if necessary, the next step is to apply a coat of white shellac. While beautiful results can be obtained with orange shellac, its use by the amateur is not recommended because brush laps may show, due to the reddish color of the orange shellac. Shellac is applied over the stain to preserve the color of the stained wood and seal it in such a manner that the color is not affected by the finishing coats that follow. Shellac is a universal sealer and can be used as a foundation sealing coat for varnish, brushing lacquer, paint, or enamel.

Shellac, as purchased from a store, should always be diluted with an equal amount of denatured alcohol. Ordinarily shellac should run from the brush like water. Two coats of thin shellac are superior to one coat of heavy shellac.

Before applying any finishing material, be sure that the furniture is entirely clean and dry. Dust with either a clean brush or a lintless clean cloth. Place the furniture upon pieces of glazed paper to prevent the brush from collecting dirt from the underlying surface. The finisher's clothing should also be free from dust. When applying shellac, start with the part that is least conspicuous. Do not apply shellac on a rainy or damp day, as shellac has the property of absorbing water, and may not dry properly. Wherever possible, apply the shellac with brush strokes running parallel to the grain of the wood. The first coat of shellac should dry within fifteen to thirty minutes. Due to the fact that shellac dries quickly do not attempt to work over or reshellac spots that appear uneven. Shellac should be brushed as evenly and quickly as possible.

Rubbing the Underlying Coats of Shellac.—After drying it may be found that the shellac is slightly rough, due to dust and uneven brush strokes. The roughness may be removed by either rubbing the finish lightly with fine steel wool, or with very fine or worn sandpaper (see page 11). New sandpaper may be made less sharp by rubbing two pieces together; this will knock off the sharp points. Steel wool is easier to use than sandpaper, especially upon irregular furniture surfaces.

In smoothing the first coat care should be taken not to rub through the shellac and stain, down into the bare wood. Special care should be taken not

to rub through the finish on the edges. A very light stroke may rub through the shellac and stain on the edges, exposing the bare wood. After the first coat is rubbed smooth, dust the entire piece to remove all bits of steel wool or sandpaper dust. Another coat of shellac can then be applied. Allow about one hour for the second coat to dry. It will be found that each succeeding coat of shellac takes longer to dry. This is because each coat dissolves the shellac underneath and unites with the underlying coat.

Two or three coats of shellac usually produce a satisfactory finish. Ordinarily the final coat of shellac is treated differently from the underlying coats, as the last coat must not only be smooth, but also polished.

Rubbing and Polishing the Last Coat of Shellac. — The final coat of shellac is rubbed with fine pumice stone (2F or 3F), mixed with any light mineral oil. Most hardware stores sell rubbing oil, but if this is not obtainable, linseed oil or a light grade of machine oil can be used. Pumice stone is an abrasive powder used to smooth the last coat. The oil lubricates the pumice stone and keeps it from scratching the finish.

Mix the pumice stone in the oil until the mixture is about the consistency of thin batter. (Some finishers sprinkle pumice stone upon the surface, then add oil.) Apply the pumice and oil mixture to the finish by means of a rubbing pad. Rubbing pads may be made from pieces of old felt or several thicknesses of folded cloth. Some finishers use the palm of the hand for rubbing. Wherever possible, all rubbing is done with the grain of the wood. Occasionally wipe a little spot clean to see if the finish is smooth. Take care to avoid rubbing through the edges. After rubbing is completed, wipe off the oil and pumice with a soft cloth. Follow by further cleaning the surface with a cloth moistened either with liquid furniture polish or furniture wax. Polish the finished surface by briskly rubbing with a soft cloth.

Caution: Never rub shellac with pumice stone and water. Shellac absorbs water. This may ruin the entire finish.

Finishing with Varnish

A varnish finish protects the wood. It is easily cleaned, but easily scratched. Varnish may be difficult to use by amateurs, as varnish is hard to apply without collecting dust. Varnish, as a finish for furniture, is being used less now than formerly because of the recent development of clear lacquer.

A varnish finish is applied in much the same manner as a shellac finish. First stain the article if necessary, then give the stain a sealing coat of thin shellac. If shellac is not available, a coat of thin varnish may be used. Follow by applying one or two undercoats of varnish. Allow each coat to dry thoroughly, then rub it either with steel wool or fine sandpaper. Apply the final coat of varnish. After it is dry, rub with pumice stone and water if a dull finish is desired, or with pumice stone and oil if a higher polish is wanted. If a very glossy finish is desired, rub the final coat with rottenstone and oil. Rottenstone is a soft, fine stone powder, and may be used to rub a shellac as well as a varnish finish.

If, after the final varnish coat has been polished, the finisher is not satisfied with the final results, and desires to apply another coat, use the following procedure. First remove all traces of the rubbing oil or furniture polish by washing the surfaces with either naphtha or high test gasoline. Varnish will not adhere nor dry upon a greasy surface. After all oil has been removed, remove all runs and dust specks in the varnish by rubbing the surface with steel wool or very fine sandpaper, or a 4/0 or 6/0 garnet paper. A final coat of varnish can be no smoother than the underlying coats. All *shine* or *gloss must be removed,* because varnish will not adhere to a glossy undercoat. The final coat is then applied and rubbed in the usual manner.

Finishing with Clear Brushing Lacquer

A good lacquer finish has the advantage of being waterproof. It does not check or crack, and is extremely tough and resistant to mars and scratches. It is easy to apply, and a beautiful finish may be obtained through its use.

Methods for laquer finishing are almost identical to those used for varnishing. First stain the surface if necessary (see page 14), then cover the stain with a sealing coat of thin shellac (see page 15). If shellac is not available, a coat of thin varnish may be used. Rub the shellac or varnish coat with steel wool or sandpaper (see page 15). Follow by applying a coat of clear brushing lacquer. Use lacquer as it comes from the can. However, since brushing lacquer evaporates very quickly, it may become too thick. In this case thin the lacquer with a lacquer thinner made for the brand of brushing lacquer that is being used. Denatured alcohol, turpentine, and linseed oil *cannot* be used for thinning brushing lacquer. Allow the coat of lacquer to dry. Usually one coat of brushing lacquer is sufficient.

The final lacquered coat may be rubbed smooth with either pumice or rottenstone, using either oil or water as the lubricant (see page 16). If more than one coat of lacquer is necessary, rub the undercoats with steel wool or fine sandpaper. Polish the final coat with either furniture polish or wax.

Opaque lacquers have colors added to them. Such lacquers should be thinned in the same manner as the clear brushing type just described.

Finishing with Linseed Oil

The simplest and oldest of all finishes is the oil finish. No staining is required for this finish. However, linseed oil darkens wood. An oil finish is more suitable to the dark woods unless the darker color is objectionable. A linseed oil finish is very durable, is waterproof, and does not show scratches or mar easily. However, much patience and "elbow grease" is required to produce a good oil finish. An oil finish is particularly effective when used upon walnut, cherry, and mahogany. A mixture of one-half linseed oil and one-half turpentine is rubbed upon the surface with a soft cloth. The oil-turpentine mixture should be hot. This mixture should be heated in a double boiler to prevent ignition. Either raw or boiled linseed oil may be used.

After coating the piece with the oil-turpentine mixture, allow it to dry from 30 to 40 minutes, after which rub the surface vigorously with a soft, clean cloth.

Carvings and crevices are polished with a soft brush similar to a shoe brush. This process is repeated many times until a soft polish or "patina" is built upon the piece. Allow about two days between the oil applications. From four to eight coats of oil are usually needed to make a soft gloss on the wood.

Caution: See page 14 concerning the disposal of oily cloths.

Finishing with Penetrating Seal

A number of penetrating wood seals have been placed on the market and may be used as finishes for wood. Such a sealer penetrates the wood and protects it by more or less sealing the pores. Penetrating seal cannot be applied over any other old finish. The old finish must be *thoroughly* removed and the surface clean, smooth and dry before applying penetrating seal. The pores of the wood must be open to allow penetration of the finish.

To apply a wood seal follow directions on the container. In general, the following plan is followed. The penetrating seal is applied with a cloth, pad, or brush and allowed to stand for a length of time, varying with the type of seal. After this period, wipe with a dry cloth and rub gently with fine sandpaper or fine steel wool. Apply a second coat in the same manner. After finishing in this way, wax may be applied to preserve the finish.

Finishing with Wax

Wax may be used as a finish by applying the wax upon the bare wood from which the old finish has been removed. Wax is especially effective upon hard woods such as mahogany, cherry, walnut, oak, or maple. A wax finish is durable and does not scratch or mar easily. Although a wax finish may water spot, these spots usually can be easily removed.

For a wax finish use either liquid or paste furniture wax and apply it to the furniture surface by means of a soft clean cloth. If paste wax is used, place a small amount of it in the folds of a cloth and rub this pad over the surfaces of the furniture. Apply a thin coat of wax evenly over all surfaces. Whenever possible, apply with the grain of the wood. Allow several minutes for drying, then rub the surfaces briskly with a soft clean cloth. A woolen cloth makes the best polishing cloth. Repeated applications of wax followed by brick rubbing result in a soft, beautiful gloss.

Any type of furniture finish may be benefited by the use of furniture wax, because the wax not only polishes the finish, but to a considerable extent waterproofs it.

Commercial paste waxes give satisfactory results; a wax may be made at home using the following formula.

A Home Made Paste Wax:

5 ounces of beeswax
½ pint of turpentine

Place beeswax and turpentine in the upper part of a double boiler and heat in hot water over a flame until the wax dissolves.

This wax may be colored by adding burnt umber, either in powdered form or ground in oil. The consistency or thickness of the wax may be varied by increasing or decreasing the amount of turpentine added to the beeswax.

Opaque Finishes

There are several types of opaque finishes. Flat paints produce a dull opaque and attractive finish. A glossy finish may be obtained by use of a gloss paint, enamel, or a clear varnish applied over flat paint. A glossy finish is more durable and shows soil less quickly than a dull finish.

Paint or enamel should be of proper consistency before being applied. Flat paint is usually of a consistency that is thinner than varnish. Gloss paint has a consistency about equal to varnish. Enamel is varnish with suitable coloring matter added and is heavier than ordinary varnish. To thin paint, varnish or enamel, follow directions on the container, using the material recommended for thinning (see page 17 for opaque lacquer). Stir paint or enamel before applying it to a surface to distribute the coloring matter throughout the mixture.

Painting and Enameling a Surface from Which the Finish Has Been Removed. — Furniture from which the old finish has been removed and which is to be painted, should first be given a sealing coat of thin shellac. After the shellac has been smoothed with steel wool or sandpaper (see page 15), apply an undercoat of flat paint of the approximate color or a lighter color. When dry, rub with sandpaper or steel wool until smooth. Apply a finishing coat of paint or enamel.

If after what was intended as the final gloss coat is applied, another coat is needed, the gloss coat must be thoroughly dulled by rubbing with sandpaper or steel wool. Paint or enamel will not adhere to the smooth surface of an underlying gloss coat. Allow about twenty-four hours for each coat of paint or enamel to dry. Some enamels require even longer than twenty-four hours. A finish is dry when the thumb can be held firmly upon the surface for thirty seconds without leaving the impression of the thumb on the surface. A final enamel coat can be rubbed with pumice stone the same as varnish, to obtain a smooth and polished finish.

Painting or Enameling over an Old Finish. — If furniture that is to be repainted has a finish that is free from checks and cracks, it may not be necessary to remove this finish before painting or enameling. In this case, remove all gloss from the old finish with medium (No. ½) sandpaper and then apply the undercoat (see page 16). In some cases an undercoat is unnecessary. This is the case if the final finishing coat has a color pigment strong enough to cover the old finish completely. For example, the finisher may desire to re-enamel a white kitchen table in white or a light color. In such cases, where the color of the finishing coat either closely approximates or is darker than the old finish, the finishing coat may be applied without the application of an undercoat.

Some furniture has been repainted so many times that the layers of paint have become quite thick and the details of mouldings, turnings, and carvings have become filled with paint. In such cases it is usually best to remove the old paint before repainting.

Furniture that has been painted black cannot easily be painted white or a light color by simply applying light coats, as the black persists in showing through the lighter colors. To apply white or light colored paint over black paint successfully, first apply a coat of aluminum paint.

Using Flat Paint and Varnish to Obtain a Glossy Finish.—A method of obtaining a glossy finish without the use of enamel is by applying varnish over dry flat paint. This method is satisfactory to use over flat paints that are dark in color. The average varnish is amber colored and will alter the color of white, ivory, or other light colors. Damar varnish is a clear varnish that does not change the color of a painted surface. To determine the effect varnish would have on the appearance of a painted surface, brush a little varnish upon a piece of clear glass, then look through the glass at a surface covered with the flat paint. This will show the final color of the furniture if the varnish were to be applied.

When the method just described is used, cover the furniture evenly with flat paint and when dry sand until smooth. Dust all surfaces and then apply a coat of varnish. Varnish is transparent and permits the color to show through, and at the same time gives a gloss to the furniture. This final varnish coat can be rubbed with pumice as described on page 16.

Care of Brushes

Few brushes ever wear out; most of them become useless because of neglect or carelessness in cleaning. When a brush will not be used within forty-eight hours, it should be cleaned in the same liquid that is used to thin the finishing material in which the brush was used; for example, clean a shellac brush in alcohol, a lacquer brush in lacquer thinner, and a varnish or paint brush in turpentine or linseed oil. Dry the brush thoroughly, then wrap it in glazed paper and hang, or lay it upon a flat surface.

Avoid standing a brush upon the end of its bristles, as the weight of the brush will permanently bend the bristles. A brush may be suspended by a hole bored through the handle. Some finishers clean a brush, then work vaseline or cup grease between the bristles their entire length, then wrap the brush in glazed paper and store for future use.

Care of Furniture in the Home

A good furniture finish requires proper care if it is to retain its quality. Furniture that receives proper care may increase in beauty as time passes. If furniture is not abused and if defects which result from use are treated to make them less noticeable, refinishing of the furniture may be unnecessary throughout its entire life.

Extreme changes in temperature and humidity may not only affect the finish of furniture but may also affect the wood and glue. Thus, placing furniture over a hot air register or near a radiator or stove may damage both the finish and the glue joints. Temperature changes may cause the veneering to loosen and check if veneered furniture is placed against outside walls of a room in the winter.

Treatment of Finish Defects.—If furniture is badly nicked or scratched, or if the finish is worn through, the defects may be rendered less noticeable by coating the damaged portions with an oil stain made as described on page 14. After applying the stain wipe off the surplus with a clean cloth. After drying for twenty-four hours, the finish can be polished with furniture wax or liquid polish.

Shellacked surfaces may turn a milky white when placed in excessively damp places, or when water is spilled upon the surface. This sometimes can be removed by placing the piece in a warm and dry room. Another method of removing the white film is as follows: roll a soft clean cloth into a ball, allowing no raveling or threads of the cloth to protrude; then soak the ball in alcohol and squeeze until nearly dry. Move the moist ball *very lightly* with a circular motion over the discoloration. If the discoloration does not disappear in a minute or two the process should be stopped, as it is probable that the treatment will not be effective. Take care that the alcohol does not remove the shellac finish. A hot flat iron held close to the surface will sometimes remove the blemish.

Milky discoloration on a varnish finish may sometimes be removed by rubbing with a cloth moistened with linseed oil, olive oil, or rubbing lightly with spirits of camphor. Many water discolorations cannot be removed, in which case it is necessary to refinish the surface.

Water may produce gray spots on a wax finish. These spots usually can be removed by applying another coat of wax, and polishing it. If the spots do not disappear, remove the entire wax finish by rubbing it with a cloth dampened with turpentine or naphtha. Apply a new wax finish.

Cleaning and Polishing.—An oil finished piece of furniture should occasionally receive a rubbing with oil and turpentine. A waxed surface should receive a reapplication of wax and a vigorous rubbing once or twice a year, or more frequently, depending upon the amount of use given it. The furniture surface should be cleaned before applying oil or wax.

Varnished, lacquered, and painted furniture may be cleaned with a cloth wrung from a solution of neutral soap and warm water. Follow by washing the surface with a cloth wrung from clean water. Rub dry with a clean dry cloth. Then apply furniture polish or wax and polish thoroughly.

Varnished or lacquered furniture that is excessively dirty may be cleaned by rubbing with a cloth dampened with naphtha, gasoline, or turpentine. Follow this by a vigorous polishing with wax and a clean cloth. Use only clean cloths for cleaning and polishing furniture. A soft light colored cloth is desirable because dirt which accumulates on it can be seen.

A formula for a good and economical liquid furniture polish:

1 part linseed oil
2 parts turpentine

This formula cleans as wells as polishes. It is good not only for oil finished furniture, but can be used satisfactorily upon shellacked, varnished, or lacquered surfaces.

Early Ohio Furniture

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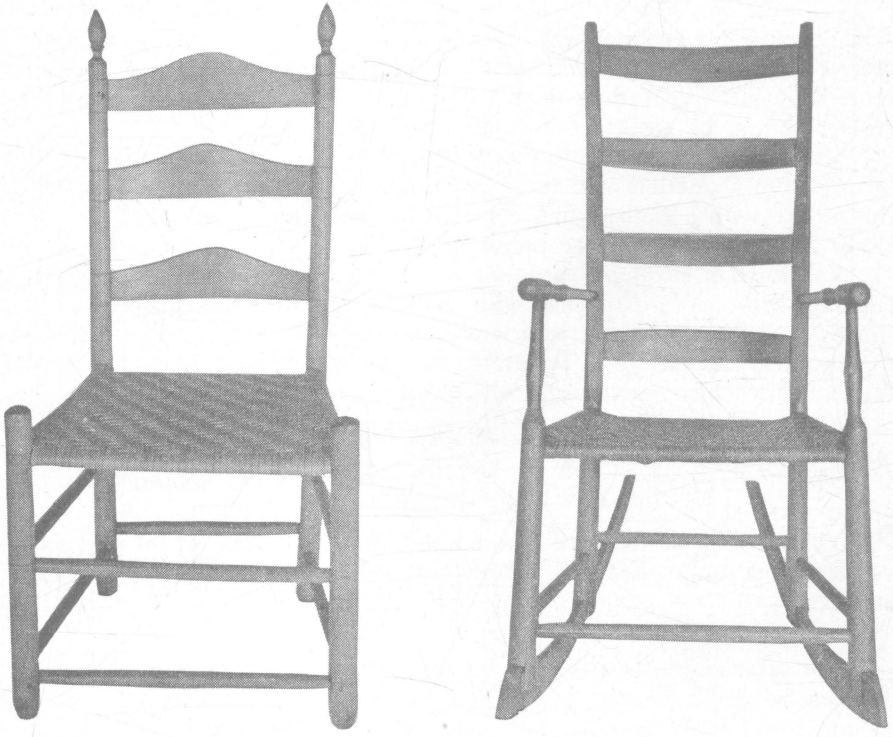
MUCH FURNITURE was made in the eastern section of America previous to the settlement of Ohio. The design of early American furniture followed closely the period designs of English furniture. However, because of the distance from and the difficulty of communication with England, furniture styles in early America tended to lag about twenty years behind similar styles in the mother country.

Ohio was settled at the beginning of the nineteenth century. Many of the styles made in the eastern states previous to this time were never made in Ohio. Some early Ohio furniture made around 1800 derived its style from the classical straight line design of the English cabinet makers, George Hepplewhite, date of birth unknown, died, 1786; and Thomas Sheraton, 1751-1806. Figs 14 and 17 show this influence.



Figs. 10 and 11.—Ladder back chairs, from about 1630 to present. Such chairs have been made and used in America since the time of the Puritans. People living in various sections of Ohio still make ladder back chairs by hand and sell them. The rocking chair is an American invention.

Fig. 12.—Type of Windsor side chair. Arm Windsor chairs were also made. Note the saddle seat.

Fig. 13.—A painted chair of the early nineteenth century. Empire characteristics are shown in the back rail and splat.

From 1810 to 1850 much American Empire furniture was made in Ohio. In 1804, Napoleon I, Emperor of France, caused the creation of a new style of furniture known as French Empire. This was a debased conception of the designs of ancient Rome and Greece. At this time American citizens gratefully remembered the aid France had given them during the American Revolution. American cabinet makers enthusiastically created their conceptions of French Empire furniture, and thus established the period of American Empire. Duncan Phyfe, 1768-1854, a cabinet maker working in New York City, was the outstanding designer of this period.

Late Empire furniture is often erroneously designated "Colonial" furniture. The term "colonial" should apply only to furniture made during the period when this country was an English colony.

The American Victorian style, 1865 to 1880, followed the Empire period. It was English in design origin. Much of this furniture was unattractive, because of the use of extreme curves and over ornamentation.

Styles such as Eastlake, Mission, and Golden Oak followed the Victorian. Much of the furniture of today is designed to follow the lines of some of the styles mentioned above and which originally were planned more than one hundred years ago. Other so-called "modern furniture" is based upon straight architectural lines of today.

Fig. 14.—Pine table with pegged mortise and tenon joints, about 1790, frequently called carpenter furniture.

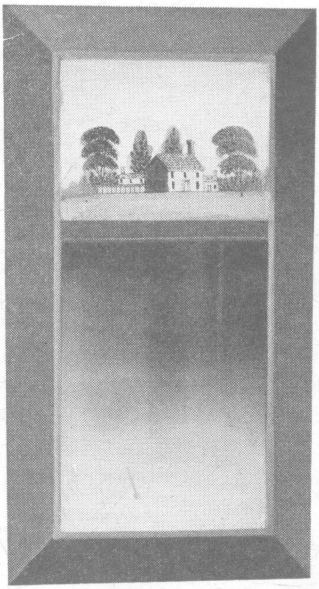


Fig. 15.—Small hand painted mirror, about 1820.

Fig. 16.—Early American Empire chest of drawers about 1810. The classical columns and lion's paw feet are typical of the early American Empire.

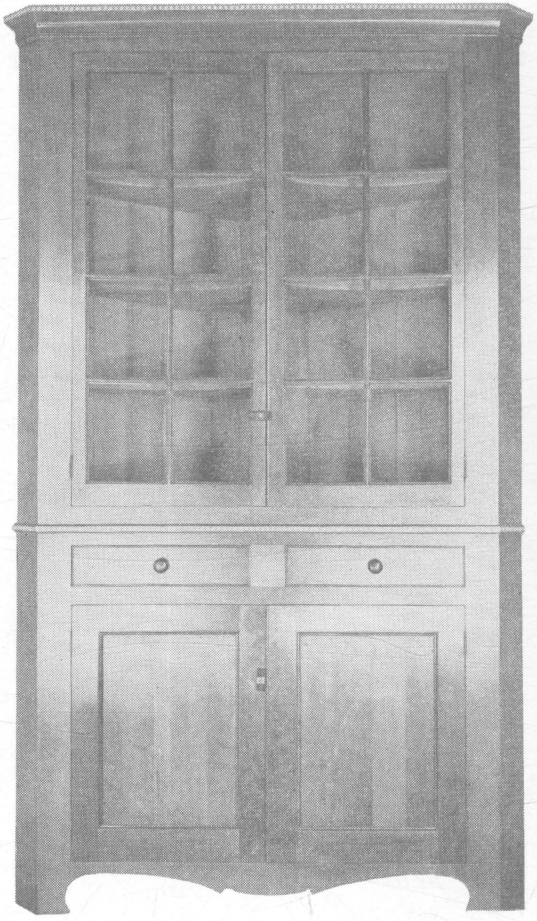


Fig. 17.—Early American corner cupboard, about 1800. The straight line design of this cupboard shows the influence of the English cabinet makers. Hepplewhite and Sheraton.

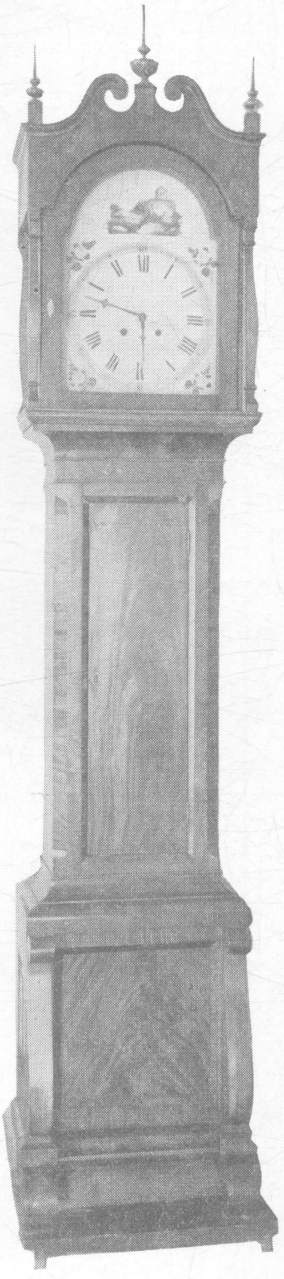


Fig. 18. — Grandfather clock, showing American Empire influence, about 1810. The works for such clocks often were made in England and the cases by local cabinet makers.

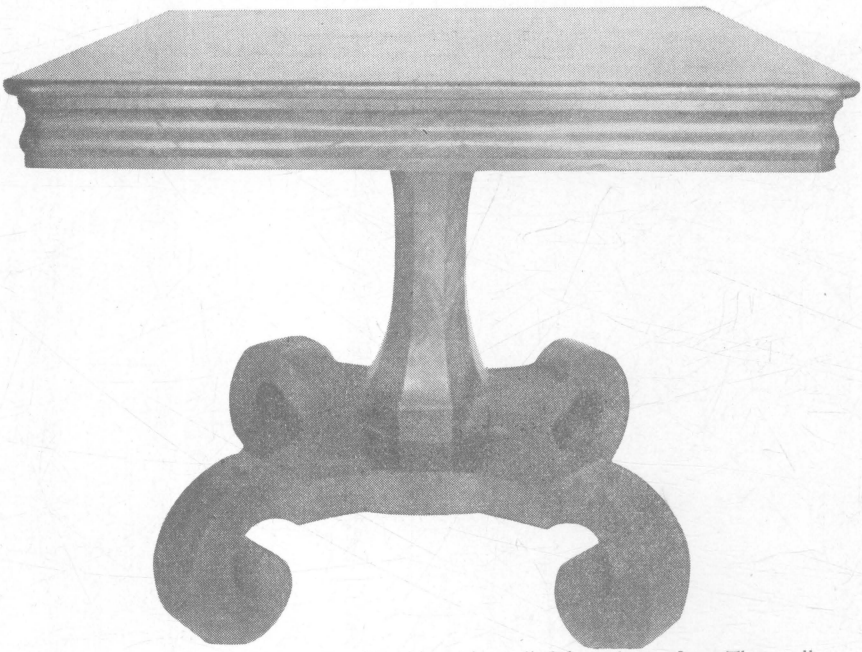


Fig. 19.—Veneered mahogany Empire table with scrolled feet, about 1840. The scroll is typical of the late Empire period.

Fig. 20.—Late Empire table, about 1850. The beaded mouldings on the apron and plinth probably indicate a transition toward the more ornate Victorian style.

Fig. 21.—A typical late Empire fiddle back chair, about 1840. This style was made of solid Cuban or Santa Domingan mahogany with the back rail, splat, and seat apron veneered with crotch mahogany.

Fig. 22.—Drop leaf table, late Empire period, about 1840.

Fig. 23.—Cherry drop leaf table, late Empire period, about 1850.

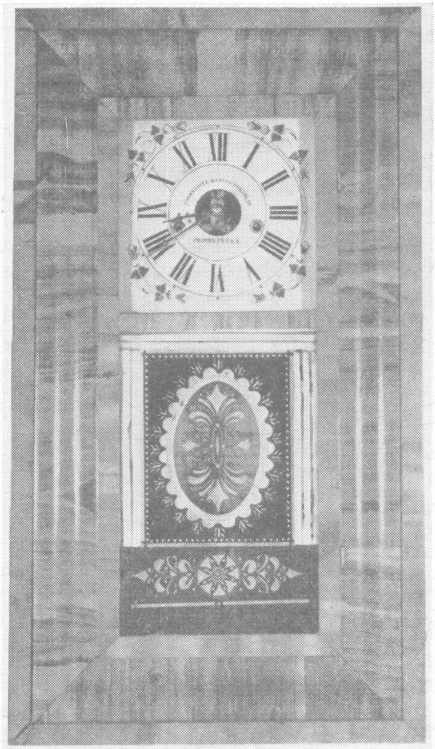


Fig. 24.—Eight-day wall clock, about 1860. The fronts of such clocks were usually made of veneered mahogany, while the sides were made of cherry.

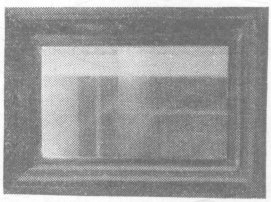


Fig. 25.—Chest of drawers, about 1860. Chests of drawers were usually made of cherry, pine, or maple. Some chests were made with sides and tops of cherry, and the drawer fronts veneered with Cuban or Santa Domingan figured mahogany.

Ogival mirror frame, about 1830. Such a frame was usually made with a white pine base upon which was glued fancy Cuban mahogany veneer.

Figs. 26 and 27.—American Victorian chair and sofa, about 1870. Woods commonly used were rosewood and walnut.

This style of design marks the beginning of machine produced furniture. Black haircloth was usually used as the upholstery fabric.

The boxed cushions illustrated are not typical.

Exhibits of Ohio Furniture

Pieces of Ohio furniture are included in permanent collections, located in various sections of Ohio. Following is a list of the locations of such exhibits which are open to the public at stated times. Furniture used in Ohio homes during the early development of the state, and also furniture used during later periods, is represented in the exhibits listed here.

Campus Martius State Memorial	Marietta
Garfield House	Mentor
Grant Historic House Museum	Point Pleasant
Ohio furniture, about 1820	
Hanby Memorial	Westerville
Ohio furniture, about 1850-60	
Harper House	Unionville
Historic House Museum	Zoar
Ohio State Museum	Columbus
Pioneer log cabin—furnishings about 1840	
Alfred Kelly furniture—about 1860	
The Clippert period room—about 1870	
Schoenbrun Memorial	New Philadelphia
Taft Museum	Cincinnati

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Figures 10, 12, 17 were made available through the courtesy of the W. R. Hobbs family.

References

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For those who are interested in pursuing the study of furniture and its finishes, the following books are recommended:

1. *Wood Finishing,* by Harry R. Jeffrey. The Manual Arts Press.
   This little book is excellent for the beginner. It explains in a simple manner the fundamental processes of wood finishing.

2. *Principles of Mill and Paint Shop Practice,* by Ralph G. Waring. The Bruce Publishing Company.
   This book explains in detail the methods of fine hand finishing.

3. *Furniture Finishing, Decoration, and Patching,* by Pattou and Vaughn. Frederick J. Drake & Co.
   Practically all methods of finishing are described in this book. It is well illustrated and makes an excellent text for the person who knows something of wood finishing.

4. *Problems of the Finishing Room,* by Walter K. Schmidt. The Periodical Publishing Co.
   All finishing methods are considered from the standpoint of the professional finisher and the furniture manufacturer. However, this book can be understood by the beginner in wood finishing.

5. *Furniture Treasury,* by Wallace Nutting. Old America Company.
   This book considers the design and styles of American antique furniture. It is profusely illustrated and describes furniture, early hardware, and household utensils.

6. *The Practical Book of Interior Decoration,* by Eberlein, McClure, and Halloway. J. B. Lippincott Co.
   The use and arrangement of furniture and home furnishings is considered in this book. It contains numerous illustrations.

7. *The Identification of Furniture Woods,* Circular No. 66, U. S. Department of Agriculture, Washington, D. C.
   This bulletin illustrates and describes the characteristics of the principal woods used in American furniture.

8. *Ohio Art and Artists,* by Edna Maria Clark. Garrett & Massie.
   Pages 22 to 29 of this book describe some early Ohio furniture and factors which influenced its design and structure.

9. *Elements of Interior Decoration,* by Whiton. J. B. Lippincott Co.
   Pages 19 to 315 include a description of furniture and architectural styles from early to modern times.

Contents

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